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Patricia Dey  
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## USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

**THE EFFECTIVENESS OF SALT BATHS IN POST PARTUM PERINEAL  
HEALING**

**BY**

**Patricia Dey**

**A Thesis Submitted in Partial Fulfilment of the  
Requirements for the Award of**

**Bachelor of Health Science (Nursing) Honours at the  
School of Nursing, Edith Cowan University**

**Date of Submission: 27th May, 1991.**

### Abstract

Midwives have advocated the use of salt baths for the relief of perineal trauma in post partum women because they believe in their therapeutic powers. In an extensive review of the literature no scientific evidence has been found to support this belief. The use of salt baths has been discontinued in favour of showers and normal hygiene in many obstetric units. The purpose of this study is to discover whether the faith of the believers is misplaced or justified. It is designed to contribute to the body of knowledge of current nursing practice and provide a scientific base for change. This is a comparative study using a pre-test post-test untreated control group design. The population studied included patients at a large metropolitan teaching hospital who had sustained an episiotomy, sutured tear or combination of episiotomy and tear, had been admitted to one of two postnatal wards, spoke English and were not already taking part in the Raine study. A sample of 114 patients were allocated to one of two groups: one group had showers (normal hygiene) and salt baths and the other group had showers only. The REEDA scale devised by Davidson in 1970 was used to evaluate the condition of the perineum within the first 24 hours post delivery and

approximately 96 hours later. It was found that the second REEDA score of patients who had had salt baths was significantly lower ( $p = <.05$ ) than that of those who used showers only. Of the 55 patients who had salt baths, 34 subjectively endorsed their value stating that they were soothing and comfortable and made them feel cleaner than showers only. Six felt that they were of little benefit. Findings of this study suggest that the faith of those who believe that salt baths provide comfort and promote healing of an episiotomy or perineal laceration following vaginal delivery is justified. Midwives may continue to advocate the use of salt baths knowing that their effectiveness has been supported by this research. Because the study was carried out by a single researcher and is the first to compare the effectiveness of salt baths and showers with showers only replication of the study is recommended to confirm the result obtained.

"I certify that this thesis does not incorporate, without acknowledgement, any material previously submitted for a degree or diploma in any institution of higher education and that, to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where due reference is made in the text".

Signature.....

Date.....8.10.91.....

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The patients who were so willing to participate in the interests of science and without whose assistance the study would not have been possible.

Nancy from computer services who saved my sanity several times.



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## Chapter 1

### Introduction

#### Problem

Sitting in a warm salt bath four to five times a day is the treatment commonly recommended to patients in obstetric units to provide comfort and promote the healing of an episiotomy or laceration following a vaginal delivery. During the early post partum period the new mother has difficulty dividing her time between the needs of her new baby, her visitors and herself. She is emotionally labile and fitting salt baths into an already busy day can add to her anxiety.

A search of obstetrical nursing textbooks has failed to find support for the above practice currently or historically and in many obstetric units the use of salt baths has been discontinued in favour of showers and normal hygiene. This follows the example set in some surgical settings where wounds are no longer cleaned with antiseptic and sealed postoperatively but are left open and showered daily.



### Purpose of the Study

The purpose of this study was to discover whether salt baths promote healing, prevent infection and provide comfort when used to treat perineal trauma. Perhaps showers alone would provide effective care of the perineum while allowing the mother more time for rest and adaptation to her new role.

Nurses are beginning to question many practices which have been carried out over a long period without any scientific base. This questioning is leading to research which is in turn leading to the elimination of some practices and the justification of others. Midwives have advocated the use of salt baths without the benefit of scientific support. The treatment is being discontinued, again without the benefit of scientific support. Many patients, midwives, and doctors believe in the value of salt baths. Others think that they are a waste of time. Research is therefore necessary to justify the effectiveness of the treatment.

### Object of the Study

The object of the research was to contribute to the body of knowledge of current postpartum nursing practice related to perineal healing and comfort, and provide a scientific rationale for change.

### Questions for Study

This study assessed the effectiveness of the treatment of episiotomy and laceration currently recommended by nursing staff. The study was guided by the following question. Are combined salt baths and showers more likely than showers only to provide comfort and promote healing of the perineum following episiotomy or laceration in the first four days post partum?

Because it has been widely believed that the amount of salt recommended has an osmotic effect on perineal tissue the study sought to answer a second question. Will treatment with salt baths lead to a greater degree of pinkness and moistness in the perineal tissue than showers only in the first four days post partum?

### Hypotheses

Five hypotheses were tested

1. Perineal trauma of patients treated with salt baths will heal more rapidly than that of those who use showers only in the first 96 hours post partum.

The null hypothesis states that there will be no difference in the rate of healing of perineal trauma between the two groups.

2. There will be a lower rate of infection in the perineal wounds of patients treated with salt baths than in the wounds of those patients who shower only in the first 96 hours post partum.

The null hypothesis states that there will be no difference in the rate of infection in the wounds of the two groups.

3. Patients treated with salt baths will request less analgesia for the relief of perineal pain in the first 96 hours post partum than those who shower only. The null hypothesis states that there will be no difference in the amount of analgesia requested for perineal pain between the two groups.

4. The perineal area of patients treated with salt baths will be pinker than the perineal area of patients who shower only in the first 96 hours post partum. The null hypothesis states that there will be no difference in the pinkness of the perineal area between the two groups.

5. The perineal area of patients treated with salt baths will be moister than the perineal area of patients who shower only in the first 96 hours post partum. The null hypothesis states that there will be no difference in the moistness of the perineal area between the two groups.

### Definition of Terms

Terms specific to the study are defined as follows:-

Episiotomy: "Incision of the perineal body which enlarges the introitus to facilitate the birth of the baby," (Beischer & Mackay, 1978, p. 15).

Hypertonic Solution: "A solution which causes the cell to shrink .... A solution with a sodium chloride content of more than 0.9% is hypertonic" (Cree & Rischmiller, 1986, p. 105).

Moistness: A term used by the researcher to describe a condition of the perineum believed by postnatal midwives and physiotherapists to be related to the osmotic effect on the tissues of a hypertonic solution of salt

Perineal body: "Structure composed of three layers of tissue. 1. Outer skin covering. 2. Superficial pelvic floor muscles (a)Bulbo-cavernosus (b)Transverse perinei. 3. Deep pelvic floor muscles - pubo-coccygeus," (Verrals, 1977, p. 33).

Perineal lacerations: These are divided into three categories.

"1. First degree laceration involving the skin of the fourchette.

2. Second degree laceration involving the skin of the fourchette, the perineum and perineal muscles ....

3. Third degree laceration involving the skin of the fourchette, the perineum, perineal body and anal sphincter. In some cases the tear may extend into the anterior wall of the anal canal and rectum," (Sweet, 1988, p. 235).

Perineum: "Area outlined by the vaginal fourchette anteriorly and the anus posteriorly. Deep to it lies the perineal body," (Beischer & Mackay, 1978, p. 15).

Pinkness: A term used by the researcher in conjunction with moistness to describe the condition of the perineum thought to be associated with the use of a hypertonic salt solution.

#### Assumptions

Since the study involved changes to recommendations for patient care it was assumed that patients would be interested in taking part. It was assumed that midwives and student midwives in the delivery suite and post natal wards would be supportive of the study. Because the study was supported by the hospital executive it was assumed that consultant medical officers with admitting rights to the hospital would also be supportive.

#### Limitations

The study was undertaken by a single researcher which could allow for bias in spite of the safeguards built into the design of the project.

## Chapter 2

### Review of Literature

#### Source of Literature

The Cumulative Index to Nursing and Allied Health Literature, American Journal of Nursing International Nursing Indices, Index Medicus, Medical and Health Care Indices and an on-line literature search using Medline Database were used to search for literature related to care of the episiotomy and perineal laceration, saline baths, care of wounds in general, physiology and pathophysiology of inflammation and infection and the process of healing. A selection of textbooks was examined to find the treatment recommended for perineal trauma.

#### Introduction

In describing obstetric practice in the 1920s and 30s, Bryan Williams, a retired obstetrician, said that episiotomies were seldom done as a tear constituted poor midwifery. If a tear did occur it was not repaired but ignored. Women would sometimes have their legs tied together in the puerperium in the hope that healing would take place. (See also Grant and Sleep, 1989, p. 1347). Over his years of practice this situation improved and by the 1970s women no longer needed to stay in bed for ten

to fourteen days being jug douched with the bowels confined, but because of better suturing methods, were able to move about freely soon after delivery and use a bath, shower or bidet (Williams, 1974, p. 301).

Advice to Midwives: An Historical Study of Selected Textbooks.

Recommendations for care of the perineum in obstetric nursing textbooks appear to have been directly related to beliefs about patient mobility. In 1954, when it was believed that women were invalids who must be confined to bed for at least five days post partum, and that movement would lead to wound breakdown, Corkill (p. 159) suggested four hourly swabbing with dettol and the strictest asepsis. Myles (1959) and Beischer and Mackay (1976) supported this view. Corkill had reservations about women's ability to maintain a high standard of perineal care once they were ambulant but Myles (1959) and Llewellyn Jones (1969) were more confident. Some patients were taught to carry out their own peri toilets after the fourth day while others tub bathed twice daily (Myles, p. 447). Llewellyn Jones (p. 351) agreed with Williams that improved suturing meant no need for special care. The patient could walk freely and shower twice a day.

A multitude of alternative treatments have been suggested for the care of the traumatized perineum over the years. In 1983 Butnarescu and Tillotson mentioned

sitz baths and showers, applications of heat and cold, and the use of ray lamps (p. 421). Bobak and Jensen (1984, p. 701) recommended sitz baths twice a day when ambulating, heat lamps, anaesthetic sprays, ointments, and witch hazel. Sweet (1988) suggested a daily bath or shower, use of the bidet after using the lavatory, and washing or swabbing with soap and water (p. 244). The common thread running through this array of advice to midwives over the past forty years has been perineal toilets for patients who are confined to bed and showers or baths for those who are mobile.

#### Why Salt Baths?

Since authors who recommended salt baths did not give reasons for their suggestion, a search of the literature was carried out in an attempt to trace the source. In an article on solutions available for wound cleansing, Morison (1989, p. 220) mentions that Galen (A.D. 129-200) washed the gladiators' wounds with sea water because it was uncontaminated compared with urban water supplies. The traditional use of salt baths has been questioned in nursing studies by Sherman (1979), Watson (1984), and Austin (1988). After searching the literature extensively, Sherman found the merits of sea water described by Dr Richard Russell (1750), Pearce and Houghton in textbooks in the 1940s, and Thompson (1978). The latter critically examined the use of spas in various countries and concluded that they had a placebo effect.



Having carried out an independent search, Watson quotes from these same original sources. Austin quotes Fosel and Rocha who in 1984 described a method of treating burns with boiled sea water in developing countries, and a 1974 British Medical Journal which recommended salt baths. Austin found, however, that "neither of these assertions were supported by references or evidence of improvement" (p. 81). All three authors attempted to find research to support the use of salt baths but concluded that no such evidence existed. They used questionnaires to gather information from staff and patients in their areas. In spite of the lack of evidence of the therapeutic value of salt water they found that most nurses and patients believed that salt baths were beneficial because they were cleansing, drying, soothing and healing. The amounts of salt and water used varied, with some attempting accurate measurement while others threw a handful of salt into differing quantities of water.

An extensive search of the literature failed to find any further information about the use of salt baths as a base for practice.

#### Use of Heat and Cold

In 1980 Droegmuller compared the soft tissue injuries of the athlete and postpartum patients and suggested that, as ice was being commonly used to treat one, it would be suitable for the other. He recommended

that the patient sit in a sitz bath of iced water for 20 - 30 minutes. He acknowledged that there would be sensations of cold, burning and aching before the local numbness required to achieve analgesia was obtained but believed that the major disadvantage of the treatment was the inherent bias of patients and nurses "that warm water is more soothing" (p. 1042).

Of reported studies related to care of the perineum, three compared the effects of heat versus cold as a means of reducing oedema and alleviating pain. These studies all had limitations of size and method. Ramler and Roberts (1986) asked 40 women to take alternate warm (36.7'C to 44.4'C) and cold (15.6'C to 18.3'C) sitz baths. They found that the cold baths gave greater pain relief initially but that this effect did not last. They suggested that documenting the appearance of the episiotomy site would be useful. In 1989 Hill did this. She randomly allocated 90 subjects to one of three groups; warm pack, cold pack, and warm sitz bath. Hill used the REEDA scale devised by Davidson in 1970 to objectively assess the condition of the perineum before and after treatment. No significant difference was found among REEDA or pain scores in Hill's study. In 1989 Lafoy and Geden allocated 20 patients to warm and cold sitz baths reduced to 0'C with ice. They also identified no significant differences on haematoma, sensation and distress scores following the two therapies.

While carrying out research for her Honours degree (Klimczyk, 1990) allocated 58 patients to two groups in the first twenty-four hours post partum. One group used ice pads while the other was untreated. Using the REEDA scale to assess perineal condition she found that ice significantly reduced the level of oedema in the first twenty-four hours post partum when compared with no treatment but that there was no significant difference in the level of ecchymosis or in the level of reported pain between the two groups (Klymczyk, 1990, p.36. Quoted with permission).

In unpublished research Barger (1988) used the REEDA scale when assessing the perineal condition of 150 patients allocated to iced or warm sitz baths. She found no significant difference between the two groups over a two day period (M. Barger, personal communication, March 10, 1991).

#### Nonpharmacological Applications

The following two studies have been carried out on the healing and comfort of the perineum following the application of nonpharmacological substances. In an Australian study, Barclay and Martin (1983) assessed the merits of Tucks, a commercial solution containing witch hazel, widely used in America. They compared its effect on the traumatized perineum with those of warm sitz baths, iced sitz baths, ray lamps and no treatment. The study was limited to 141 subjects divided among five

groups. A four bed room was set aside for each method and every woman with an episiotomy admitted to that room joined that treatment method thus sample selection was not random and could have influenced the results. They found that there was no difference in healing time or infection rate among the groups and that iced sitz baths were most effective in relieving perineal pain. However the variables being studied were measured on untested scales devised for their research with no assessment of validity or reliability. They recommended replication of the study on a larger scale.

In a well-controlled study of 1800 women randomly allocated to one of three "policies" (Savlon, salt baths and baths without additives) following vaginal delivery Sleep and Grant (1988) found no appreciable difference in outcome among the three groups. This study was not limited to those with episiotomy or laceration and did not evaluate bathing versus showering. The researchers recommended that 42g of salt be added to a bath of water but they did not specify the size of the bath or the quantity of water. According to information gained by telephoning a local supplier of baths (personal communication, May 14, 1991) a standard 5ft bath holds 255 litres of water. A half full bath would therefore hold 127.5 litres. Forty-two grams of salt added to 127.5 litres of water provides a 0.03% solution. If the subjects quarter filled the bath the resultant saline

solution would be 0.07%. It is possible that there was no difference in outcome between the groups because the concentration of salt in solution was negligible. A subjective assessment of the perineum was carried out by midwives who filled out a questionnaire ten days post partum. Interrater reliability and validity of the measurement carried out were again not mentioned.

#### Ultrasound and Pulsed Electromagnetic Energy.

Ultrasound and pulsed electromagnetic energy are more recent treatments of the traumatized perineum. Dyson, Creates and Partridge (1987) agree that there is a need for further investigation to substantiate claims that ultrasound accelerates recovery and relieves symptoms of soft tissue injury.

Sleep, Grant and others (1989) conducted a randomized controlled trial which compared the use of ultrasound, pulsed electromagnetic energy and placebo therapy on 414 women with severe perineal trauma. Because they compared each mode of treatment with placebo therapy, operator, subject and assessor bias were minimized. Pre and post treatment assessment of pain, oedema, bruising, haemorrhoids, and amount of analgesia taken, were carried out by a midwife coordinator and mothers who were unaware of trial allocation. Once more the measurement tool is not mentioned. Although 90% of women in each group (including the placebo group) felt that the treatment had made the pain better no clear

differences were found between the groups on any of the above measures on preliminary analyses. The researchers concluded that "preliminary analyses of results provide no basis for the widespread use of these two expensive physiotherapies in the treatment of perineal problems". They recommend further randomized trials "to justify continued use of these technologies in the postnatal ward" and suggest that this would provide an opportunity for the size of the placebo effect to be assessed (p. 1353).

#### Theoretical Rationale

Trauma associated with episiotomy and laceration stimulates an inflammatory response which is manifested by "vasodilation of the vessels of the microcirculation leading to increased blood flow; marked increase in vascular permeability to protein; exit of neutrophils (and, later, monocytes) from the vessels into the tissues; destruction of bacteria either through phagocytosis and intracellular killing, or by mechanisms not requiring prior phagocytosis; and finally tissue repair. The familiar gross manifestations of this process are redness, swelling, heat, and pain" (Vander, Sherman and Luciano, 1985, p. 604). In healing by first intention of an incised wound "the epithelium at the edges rapidly proliferates to bridge the gap before the formation of new connective tissue" (Keele, Neil and Joels, 1984, p. 62). The close proximity of the healing

perineal wound to the anus increases the risk of infection. Because many women have difficulty drying the area thoroughly, the environment may be warm and moist providing an ideal breeding ground for colonic bacteria. A major barrier to this infection is the normal microbial flora of the skin and other linings exposed to the external environment. These microbes suppress the growth of those which are potentially more virulent (Vander et al., p. 603).

#### Time of Onset of Infection

In an extensive search of the literature time of expected onset of infection in the lower genital tract was not specified. Beischer and Mackay mention the 2nd - 4th days as the most common time of onset of infection in the upper genital tract i.e. the uterus (1976, p. 385). It is possible to culture a variety of potentially pathogenic organisms from the genital tract of all pregnant women. Normally the woman is living in a balanced state with these however when there is bruising or trauma of the tissues, blood loss or pre-existing anaemia, and frequent vaginal examinations, resistance is lowered. Organisms most frequently cultured are streptococcus and gram negative bacilli, which flourish in the presence of dead tissue, clots, and maternal anaemia; E. coli, Klebsiella, pseudomonas and proteus which may already be present in the vagina because of poor perineal hygiene or be transmitted during labour or

delivery due to inadequate attention to asepsis and antisepsis; and staphylococcus and haemolytic streptococcus which are carried on the hands or in the nasopharynx of attendants. In addition, hospitals always have a supply of pathogens carried in the air as droplet particles or on utensils or linen. The classical features of an infected episiotomy wound are reddening, swelling and tenderness (Beischer and Mackay, 1976, p. 384).

Salt baths are recommended to promote healing, prevent infection and alleviate pain. There is no evidence to support the belief that any treatment can short circuit the healing process described above. Salt baths do not have antiseptic or bactericidal properties except in very strong concentrations (Ayliffe, Babb, Collins, Davies, Deverill, & Varney, 1975, p. 22) and in concentrations of up to 10% saline is an excellent medium in which to grow staphylococcus aureus (Austin, 1988, p. 80). Empirical observation suggests that strong saline solutions have an osmotic effect on the tissues. This leads to a moist inflamed wound which frequently breaks down and becomes infected. The area must be kept clean and dry to prevent the entry of bacteria but frequent washing may remove the normal flora which themselves provide a barrier to infection.

The analgesic effect of cold and warm sitz baths has been explored in recent years. Heat application leads to



increased blood flow which promotes healing and reduces pain by reducing congestion and muscle tension (Cree and Reischmiller, 1986, p. 25). Droegmuller (1980) believes that the use of heat is unscientifically based and advocates cold sitz baths because they lead to vasoconstriction, reduced oedema and inflammation, decreased excitability of free nerve endings, a raised pain threshold, and decreased muscle irritability and spasm due to decreasing responsiveness of muscle spindles to stretch. Both of these theories are based on the belief that the main cause of pain is oedema but others currently believe that pain is more closely related to activation of neuronal pain receptors by chemical mediators (Keele et al., 1984, p. 62). Since oedema is part of the inflammatory response to trauma which is a precursor of healing perhaps it should be left to run its course without attempts to reduce the effects with either heat or cold. Pain is also caused by sutures through the skin. With the advent of subcuticular suturing methods and the use of suture materials which lead to a lowered inflammatory response this cause of pain has been greatly reduced (Grant, 1989).

#### The REEDA Scale

The REEDA scale (Figure 1) was devised by Davidson in 1970 when she was working on her unpublished masters thesis "Healing of the perineum" and is used in this study with her permission. In 1971 and 1972, Carey and

Bolles, fellow students with Davidson at the University of Utah, revised the tool and used it to measure perineal healing for masters theses. In 1974, when the tool was published, it was being used by students in the Master of Science in Maternal and Newborn Nursing and Nurse-Midwifery programme at the University of Utah College of Nursing (Davidson, 1974, p. 6). Davidson does not report on the reliability or validity of the REEDA scale and said that she had not thought of it being widely used for research.

Figure 1

REEDA SCALE					
POINTS	REDNESS	EDEMA	ECCHYMOSIS	DISCHARGE	APPROXIMATION
0	None	None	None	None	Closed
1	Within .25 cm. of incision bilaterally	Perineal, less than 1 cm. from incision	Within .25 cm. bilaterally or .5 cm. unilaterally	Serum	Skin separation 3 mm. or less
2	Within .5 cm. of incision bilaterally	Perineal and/or Vulvar. between 1 to 2 cm. from incision	Between .25 to 1 cm. bilaterally or between .5 to 2 cm. unilaterally	Serosanguinous	Skin and sub-cutaneous fat separation
3	Beyond .5 cm. of incision bilaterally	Perineal and/or Vulvar. greater than 2 cm. from incision	Greater than 1 cm. bilaterally or 2 cm. unilaterally	Bloody, purulent	Skin, sub-cutaneous fat and fascial layer separation
SCORE					
TOTAL					

(Davidson, 1974, p. 7.)

It had been designed most specifically for nurses in the initial stages of their training to help them to improve their practice by identifying the main areas of perineal trauma when they were assessing the perineum. Student nurses had found it most useful (N. Davidson, personal communication, July 12, 1990).

The measurement framework of the tool is based on the premise that "information about the healing process in the perineal region can be gained by breaking down the areas of perineal discomfort to their smallest component parts and rating these against a standard known for healing in other parts of the body" (Davidson, 1974, p. 7). The smallest component parts used by the author are redness (inflammation) edema (oedema) ecchymosis (bruising) discharge from the wound area and approximation of skin edges, giving the acronym REEDA. These categories correlate well with subjective measures used by other researchers. Barclay (1983, p. 14) assessed rate of healing under the categories of clean and dry, good union, pulling, slightly gaping, and gaping. She included clean and dry, slightly moist, moist, inflamed and sloughy when assessing degree of infection. Sleep and Grant (1988, p. 56) included breaking down, healing by second intention, infected, and residual bruising in the assessment carried out by midwives at 10 days post partum. Hill (1990, p.162)

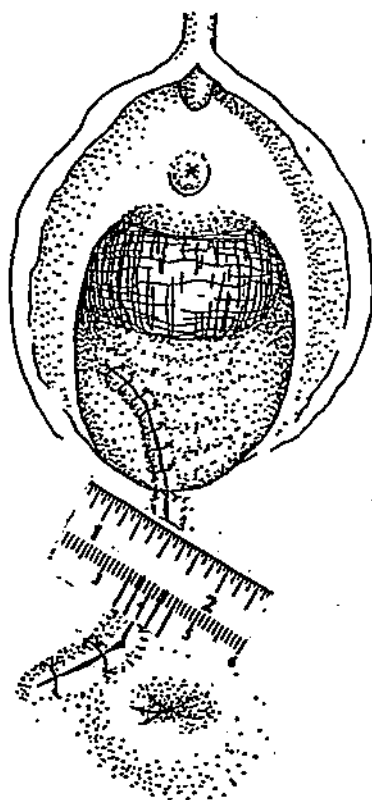
asked 10 midwifery students what they would look for in assessing the perineum after childbirth and found "the following categories mentioned at least six to 10 times by the 10 nurses: redness, swelling, bruising, drainage and suture line". Hill used "the known-groups technique to evaluate construct validity of the REEDA" scale (p. 164). Her sample included eight subjects who had an intact perineum. She compared this group with 86 subjects who did not have an intact perineum using analysis of variance and found significant differences between the two groups with regard to oedema and the total REEDA score. This supported construct validity of the tool.

Ramler and Roberts saw the need for a more accurate and objective means of assessing the perineal condition as did Lafoy and Geden (1989, p. 400). On a scale of 0 - 3 they found staff levels of agreement were 83% for haematoma and 77% for oedema after assessing nine patients by observation only. The REEDA scale meets the need for an accurate and objective means of assessing the perineum as can be seen by an examination of the numerical components shown in Figure 1. Those assessing perineal trauma use a "disposable paper tape cut to 4 cms in length and capable of measuring .25 cm in precision" (Davidson, 1974, p. 6). The patient lies in left lateral Sims position and the tape is placed at right angles to the line of the incision with the mid-point of the tape

along the line of the incision (Figure 2) to facilitate measurement of the amount of oedema, redness and bruising on either side.

Figure 2

Method of Applying Tape Measure to Perineal Wound



(Adapted from Llewellyn Jones, 1977, p. 350.)

An additional light source is used so that the area can be easily viewed (Davidson, 1974, p.6). A low REEDA score indicates an intact healing wound. A higher REEDA

score indicates a greater degree of trauma. The measures are fine and specific and ensure objective assessment. In carrying out her study Hill found what she considered serious measurement problems associated with the use of the REEDA scale. She felt that there should be a measure of the length and depth of induration of the oedema and she questioned the inconsistent relationship between the measurement of oedema and pain scores. Hill, Davidson, Bolles and Carey all tried to use the REEDA scale as a measure of comfort by assuming that a high degree of trauma indicates a high degree of discomfort. As would be expected their results were inconsistent. The REEDA scale is not a measure of pain but of healing. Hill also questions the need for a score on discharge and approximation of skin edges. She sees the early REEDA score as weighted in favour of oedema however at 96 hours or later the oedema has resolved and discharge and approximation of skin edges are relevant measures of the healing process. Hill's comments are of limited value to this study because she is examining the perineum in the first 24 - 48 hours post partum only.

To assess interrater reliability Hill served as rater A and compared herself with two staff nurses raters B and C. The raters were trained in the use of the tool by an experienced staff member. Using the Kappa statistic A & B the following correlations were established. .57 for redness, .80 for oedema, .80 for ecchymosis, .81 for

approximation but only .49 for total score. A & C had scores of .85 for redness, .83 for oedema, .72 for ecchymosis, .9 for approximation and a total score correlation of .7. This shows only moderate interrater reliability.

Klymczyk (unpublished thesis, 1990) achieved separate correlations of .98 and .99 with each of two assistants when assessing five perineums (p. 18). This result was also achieved by Barger in her unpublished research (1988).

Before commencement of this study the researcher and an assistant assessed the perineal trauma of 20 patients who were more than 24 hours post delivery and achieved correlations of .5 for redness, 1 for oedema, .9 for ecchymosis, .8 for discharge and .7 for approximation of skin edges with a total REEDA score correlation of .8. This interrater reliability was not considered sufficiently high so the study was carried out by one researcher.

### Summary

Care of the traumatized perineum has altered over the years as have attitudes to illness and health. The post partum woman is no longer seen as an invalid requiring care but as a healthy individual involved in a normal life process. The advice she is currently given to relieve the effects of the inflammatory response to perineal trauma does not appear to be physiologically

justified. Sleep and Grant (1988) found no difference in the condition of the perineum following baths with or without salt but perineal assessment was subjective and no comparison was carried out with patients using showers only. Barclay and Martin (1983) compared warm and cold sitz baths with no treatment and found no difference in healing time or infection rate however their study had limitations and they suggested replication. Because of these findings and because many midwives and patients believe that salt baths promote healing and provide comfort there is need for further controlled study using an objective measure to justify their effectiveness in the treatment of postpartum perineal trauma. The REEDA scale has been shown to be a useful and reliable means of assessing the rate of healing of the perineal wound.



## Chapter 3

### Method

#### Setting

The study was conducted in a Western Australian metropolitan teaching hospital which averages 5000 deliveries per year. Data were collected between the 22nd July and the 2nd November, 1990. During that time there were 855 deliveries at the hospital. Of these 240 met the study criteria and were allocated to the appropriate wards.

#### Population

The recommendations for care of perineal trauma outlined in hospital policy are the same for all patients regardless of the severity of the trauma sustained or medical condition of the patient. The population from which the sample was drawn therefore included all postpartum patients who sustained an episiotomy, first, second or third degree tear or combination of episiotomy and tear.

#### Sampling frame

In addition, patients were required to meet the following criteria to be eligible for the study.

1. They must not already be participating in the Raine study. These patients had been excluded by the research

sub-committee of the Board of Management of the hospital because they were already subjected to extensive questioning.

The Raine study, financed from money bequeathed by the late Perth hotelier Ma Raine, is following the growth and development of 5000 babies from 12 weeks gestation to 10 years of age, and aims to identify factors which might influence the growth of the fetus during pregnancy, or which may result in premature birth complications or delivery, or illness in childhood.

2. They must have a reasonable command of English as experience showed that this was necessary for a full understanding of the requirements of the study.
3. The hospital had three post natal wards. Patients in one of these were no longer having salt baths as there had been difficulty supervising the cleaning of the communal bath which had been installed to replace the individual bowls formerly used. Patients were required to be allocated to one of the other two wards.
4. They must not be in delivery suite for more than 24 hours postpartum because of complications such as postpartum haemorrhage or pre-eclampsia.
5. They needed to be willing to remain in hospital for at least 72 hours following admission to the study.

#### Sample

A convenience sample of 140 was interviewed. Of these 140 patients interviewed 26 were not available to

the study. Seventeen refused and nine withdrew from the study. Of the 17 who refused four wanted salt baths and were not prepared to be randomly allocated, two didn't want salt baths, and six did not give a reason. Of the five remaining one had a fractured tibia, one said she wouldn't have time, one was too sore, one too sick and one had suffered a dural puncture when her epidural catheter was being inserted during labour. Nine withdrew during the study because of early discharge, sick babies and reluctance to continue.

The final sample included 114 subjects, which was a sufficient size to test the hypotheses stated in Chapter 1.

The sample included in this study was skewed in favour of private patients. The wards from which the sample was drawn have 31 beds each. Each ward is composed of two four-bed rooms and 23 single rooms which, because of the hospital bed allocation policy, are occupied mainly by patients cared for by consultant obstetricians. Also, many patients under the care of the hospital clinic had agreed to take part in the Raine Study. In addition, clinic patients have a tendency to be discharged within 96 hours of delivery. For both these reasons they were lost to the study. Sixty-six percent of those who took part in the study were private patients and 34% were clinic patients.

### Sampling method

Prior to data collection the Clinical Nurse Specialist on delivery suite was contacted, the study was explained to her and she was asked which would be the most appropriate times of day to telephone the delivery suite midwife receptionists. The Clinical Nurse Specialist informed the midwife receptionists of the study. In addition, they were sent a letter of explanation and a request for their assistance (Appendix A).

At the commencement of the study delivery suite was contacted at 0700 hours, 1300 hours, and 2045 hours each day to get the name and ward allocation of patients who met the selection criteria. At this stage an attempt was being made to see patients between 4-6 hours post delivery. This time had been chosen because it coincided with the time patients would normally have been instructed in the use of salt baths. At the end of one week, when five patients had been interviewed, it was obvious that this was neither practical nor necessary. The hospital was no longer routinely recommending salt baths and many patients were not ready for interview so early after delivery. Thus the times of contact with delivery suite were limited to 0700 hours and 1700 hours approximately and appropriate patients were contacted within 24 hours of delivery.

Before potential participants agreed to take part in the study they were given the following explanation:

Salt baths have been used for many years at this hospital but changes are being made and they are no longer routinely recommended. Many women have found them of benefit in the past and wish to have the opportunity to continue using them. However other patients feel that they are a waste of time. In the past they have felt guilty about not having time to fit four or five in daily. No research has been done into the benefits of salt baths and the study is an attempt to discover whether they are an effective means of caring for your stitches. Taking part in the study will not endanger your health and the information gained will help to improve nursing care and patient well-being. No patient is obliged to participate in the study nor will you suffer in any way if you refuse. The study is important to many women because they wish to retain the option to use salt baths if they wish. It is also essential that you are randomly allocated to either the group which has salt baths or the group which has no salt baths. If you are given freedom of choice the results could be seen as biased because people tend to achieve better results when they do what they like than when they

do something they don't like. You may withdraw without penalty at any time. Your name will not be used on any of the information obtained or in any of the results published. You will be known only by the number on your research documents. The consent form (Appendix B) carries details of my telephone number and that of the Head of Department of the Western Australian College of Advanced Education School of Nursing and you may ring these numbers at any time if you are unhappy about any of the study procedures.

If they agreed to take part in the study they were also given an information sheet (Appendix C) which described the treatment and the reasons for the research, and reiterated confidentiality of the information obtained. The researcher's telephone number and a time when results would be available were also included on this sheet.

The salt bath record sheet (Appendix D), the shower record sheet (Appendix E) and the analgesia record sheet (Appendix F) were shown to them. The way they should use the timer was demonstrated. It was explained that they should write down the time and length of all their showers whether they were having salt baths or not. They filled in both sheets if they had salt baths and one sheet if they showered only. On the salt bath record

sheet they recorded the time and duration of their salt baths which should be taken four times a day and last for five minutes. They were told that if they were allocated to the treatment group they would be provided with a bowl, salt and measuring cup by the person caring for them once the researcher had left. It was explained that research into the relative merits of hot or cold baths was inconclusive so they could have the baths at a temperature which felt comfortable for them.

They were also informed that the analgesia record sheet would be filled in by the nursing staff but it would be helpful if patients could remind those caring for them to record analgesia, ice pads and ultrasound on this chart if they forgot. No restriction was placed on the number of times patients were to receive any of these treatments but a record of all interventions used was required.

If the patient agreed to participate in the study, the consent form was signed in the presence of a member of the ward staff. The patient was then given a copy of the consent form, the information sheet and record keeping sheets.

After written consent was obtained the perineum was assessed using the REEDA scale. To ensure that the researcher was blind to group allocation the person caring for the patient was then asked to consult the group allocation list (Appendix G). This list was

prepared before the study began using a Table of Random Numbers (Burns and Grove, 1987, p. 691) to allocate patients to the treatment or control group according to their research number. Research numbers were not issued consecutively as a further safeguard. The group allocation list was left in the office in an information file about the study which included a copy of the proposal and all research documents and was available to all ward staff. After the researcher had collected demographic data and left the area the ward staff member informed the patient of her group allocation and if necessary provided her with her bowl, salt and measuring cup.

### Instruments

#### Measurement of healing

The degree of healing present was assessed using the REEDA scale described in Chapter 2. This scale measures the empirical manifestations of inflammation. The area surrounding the wound is assessed using redness, (o)edema, ecchymosis, discharge from the wound and approximation of skin surfaces as indicators. Results are recorded on a scale of 0 - 3. Each area is given one additional point to indicate increasing severity of inflammatory signs. The highest score possible is 15 and the lowest 0. Healing is the end result of the inflammatory process. A high REEDA score indicates the presence of a high degree of inflammation. If the REEDA



score is low the level of inflammation is low and the healing process is almost complete. A healed perineal wound with no sign of redness, bruising or oedema will result in a REEDA score of zero. To ensure precise measurement disposable paper tape measures were cut into 4cm segments and marked at .25cm, .5cm and the mid-line.

The validity and reliability of the tool have been discussed fully in Chapter 2. It was found to be a useful and valid measure of the degree of healing of the perineal wound. However interrater reliability, as described in the Procedure section below, was not considered adequate for the purposes of the present study, therefore all measurement was carried out by one researcher.

#### Measurement of infection

Morrison, Cornett, Tether, & Gratz (1972, p. 302) state that "One of the first results of the presence of foreign materials in tissue is the dilation of the capillaries in the area. As a result more blood enters the tissue." The increased blood flow also carries more white corpuscles to the area. These leukocytes, they continue:

pass between the cells of the capillary walls and move toward the invading bacteria engulfing them in the process know as phagocytosis. When the number of bacterial cells ingested is greater than the

single leukocyte's digestive capacity it dies. Its remains plus active white cells and remaining bacteria are the composition of what is commonly known as pus. As this collects in the tissue materials produced by the bacteria cause a breakdown of the surrounding tissue. Fibroblasts form a wall around the area and an abscess develops. More blood is carried to the area with resulting redness, heat, swelling and pain.

Therefore redness and purulent discharge are indicators of infection. For this reason these components of the second REEDA score were analysed separately to estimate the incidence of infection.

#### Measurement of comfort

Nursing staff recorded the analgesia given to patients and the reason it was given on the analgesia record sheet. Analgesia was given for perineal pain, involution pain, backache, headaches and painful breasts. The data were analysed according to the number of occasions analgesia was required for perineal pain only. The greater the amount of analgesia taken the less effective was the treatment considered as a provider of comfort.

#### Measurement of pinkness

This measure was carried out because pinkness has been suspected by midwives of being an indicator of the

excessive use of salt. It is believed that pinkness indicates the osmotic effect of a hypertonic saline solution on the tissues. It is not a measure of infection, though it may lead to a broken down wound and subsequent infection. Pinkness of the perineum was measured subjectively by the researcher based on 12 years of experience as a postnatal midwife and was divided into two categories, slightly pink and pink.

#### Measurement of moistness

Moistness of the perineum was also measured subjectively and was divided into slightly moist and moist. Moistness is associated with pinkness in the minds of many midwives and others involved in the care of the post natal patient and is also thought to be a measure of excessive use of salt.

This was also a measure of how well the patients had dried the perineal area. Careful drying is stressed when care of the perineum is taught but is often not well achieved because of the tenderness and general lack of knowledge about the area being dried, and patient sensitivity to touching the wound.

#### Timing of showers and salt baths

All patients were supplied with kitchen timers of identical design. To time the salt baths, the patient set the timer at 5 minutes as she got into the bath and stopped bathing when the bell rang. Showers were timed by setting the timer for longer than the patient expected

to take and recording the number of minutes which had passed when the shower was finished. The results were recorded on the appropriate record sheets.

### Salt Baths

The bowls used for salt baths had a 30.5 cm diameter and contained 3.5 litres of water. Patients were asked to fill the bowl with water of any temperature they found comfortable. To ensure accurate measurement of salt patients were provided with a small plastic cup which had been previously marked at the 10ml mark and labelled 10 mls. This resulted in a 0.28% saline solution.

The bowls were those already used in the hospital. The amount of salt was that which had been specified in the hospital protocol for the administration of salt baths.

### Design

The project was of pre-test post-test experimental design with an experimental group of patients who had salt baths and an untreated control group who had no salt baths.

The independent variable was salt baths and dependent variables were the condition of the perineal wound and the amount of analgesia required.

### Procedure

Group allocation lists were prepared using the list of random numbers and these were filed on each ward (Appendix G).

To encourage staff cooperation a personal letter was given to the midwives on each ward (Appendix I).

Because student midwives were not members of the permanent staff, the research was explained to nurse educators and they were asked to give an identical letter of information to student midwives when they were allocated to the wards.

The Clinical Nurse Specialist on delivery suite was contacted and the research explained. A letter of information was sent to midwife receptionists asking for their cooperation (Appendix A).

Personal contact was made with the Director of Nursing, Nurse Managers of the Obstetrics Unit and the Postnatal Clinical Nurse Specialist .

All hospital nursing staff were informed that the study was in progress at the monthly general nurses' meeting.

To establish interrater reliability in the use of the REEDA scale the Postnatal Clinical Nurse Specialist and the researcher independently assessed the perineal wounds of the same 20 postnatal patients who were chosen at random and not part of the study. Because the level of reliability obtained of .79 was not considered sufficiently high, the study was undertaken by one researcher only. This eliminated the possibility of inter-rater error.

### Data collection

Patients were visited by the researcher within 24 hours of delivery. The research was explained and written consent obtained. The patient was given record sheets, an information sheet, a copy of the consent form and a timer. The condition of the perineal wound was assessed using the REEDA scale. The researcher gathered demographic details and left the area. Thus the researcher remained blind to group allocation of subjects. Group allocation was carried out by the person caring for the patient who checked the allocation list in the office before informing the patient of whether she was in the treatment or control group. Random allocation ensured homogeneity of groups. Patients in the treatment group were provided with their bowls, salt and measuring cups ensuring that all used the same concentration of salt and water. Patient compliance was assessed by examining the salt bath record sheet.

Patients were allowed to have as many showers as they wished and to stay in the shower for as long as they wanted. However, in order to control for the possibility that patients who did not have salt baths might compensate by taking longer showers, all patients were asked to time their showers. This variable was then statistically controlled in the data analysis.

No restriction was placed on the use of ice packs which are commonly offered to patients during the first 24 hours post delivery to relieve perineal pain and reduce oedema. The use of ultrasound is also frequently suggested. Random allocation to groups should have ensured that these variables were equally distributed across the two groups. The use of ice packs and ultrasound was also recorded on the analgesia record sheet and the data obtained were correlated with the second REEDA scores to ascertain the effect of these variables on the healing process.

The researcher visited the patient for the second time approximately 96 hours post delivery. Because babies are delivered at any time of the day or night a second visit at exactly 96 hours was not always appropriate. On many occasions the patient was asleep or caring for her baby. Some patients were discharged from hospital the morning of the day they would have been 96 hours post delivery. All subjects included in the study spent at least 70 hours carrying out the procedures involved before they were visited for the second time. Table 1 shows the means and standard deviations of the time in hours to the first assessment of the perineal wound, the time patients were actually taking part in the study, and the total time from delivery to the second assessment of the wound.

Table 1

Mean Numbers and Standard Deviations of Hours Spent in the Study

	Mean	SD
Birth to 2nd REEDA score	99.854	8.288
1st REEDA score to 2nd REEDA score	89.499	8.617
Birth to 1st REEDA score	10.354	5.404

The perineal wound was assessed, again using the REEDA scale, before the record sheets and timer were collected. The researcher remained blind to group allocation throughout. Each patient was rewarded for her co-operation with a chocolate frog and any subjective statements about the study were noted.

Ethical Considerations

The study commenced following approval from the ethics committees of the Western Australian College of Advanced Education (now Edith Cowan University) School of Nursing and the participating hospital.

According to the literature patients in neither the treatment or control groups were compromised in any way as both methods of caring for the perineum are currently used in obstetric units. Examination of the perineum is part of the routine assessment of the postpartum patient



and measurement on the REEDA scale is an extension of that assessment. The study design originally specified four to six hours post delivery for the first assessment of the perineum and 94 to 98 hours for the second assessment. As mentioned above, these times were not always convenient. Because patient well-being was of absolute importance, the design was made more flexible to allow for assessment at more appropriate times. Random allocation to groups ensured that this alteration of design did not adversely affect the results of the study.

Full details of the research were given to patients before the consent form was signed. They were given a copy of the signed consent form and an information sheet. It was made clear to them that they retained the right to refuse to participate or withdraw at any time without fear of reprisal.

Confidentiality was maintained throughout the study with all information, including demographic details, being filed under the allocated identification number. This information was kept in a locked cabinet to which the researcher alone had access. Consent forms were kept in a separate secure file the location of which was known only to the researcher.

Patients were told that they could contact the researcher, whose telephone number was on the information sheet, early in 1991 if they wished to know the results of the research.

## Chapter 4

### Data Analysis

The data were analysed by computer using the SAS statistical analysis programme. The level of significance was set at .05.

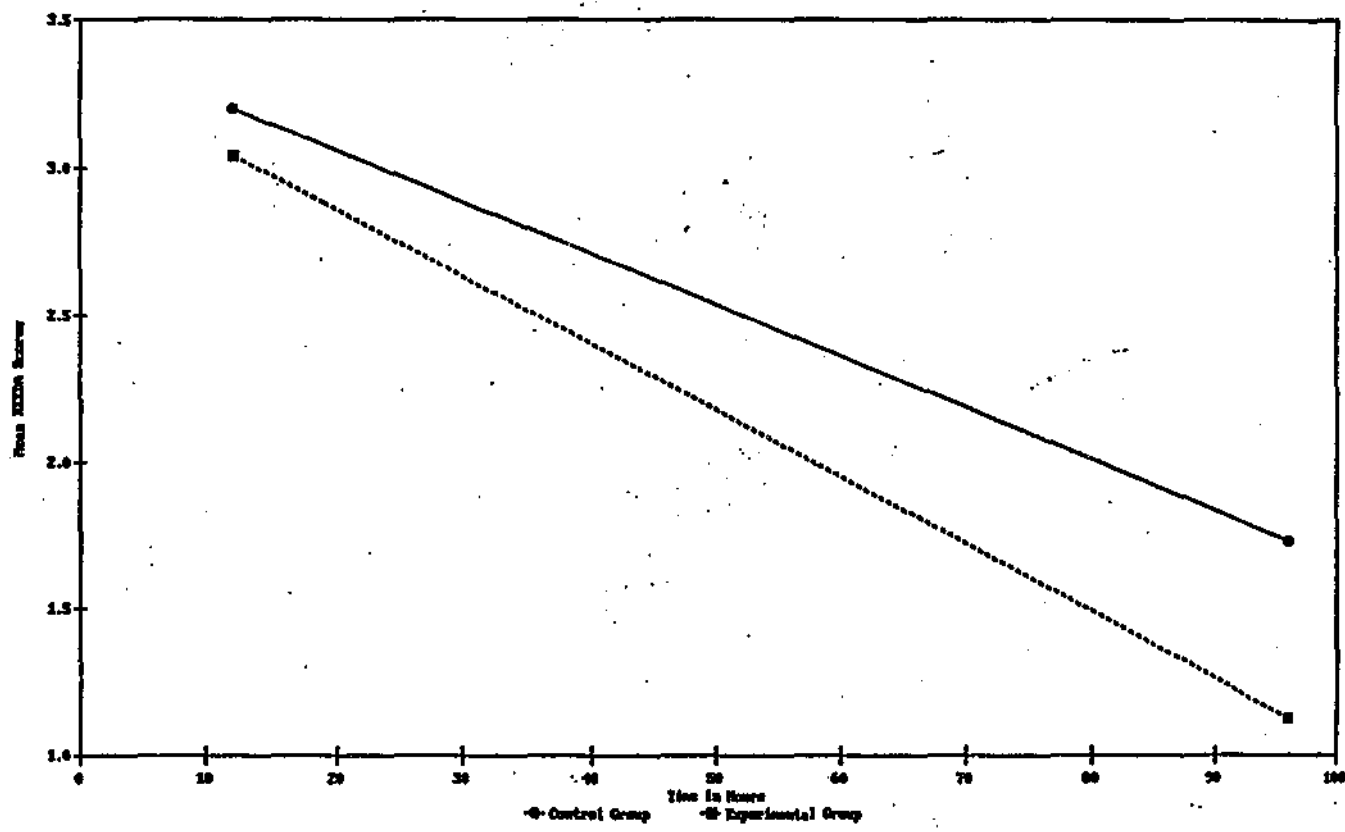
#### Effect of Salt Baths on Rate of Healing

The first hypothesis states that perineal trauma of patients treated with salt baths will heal more rapidly than that of those who use showers only in the first 96 hours postpartum.

The null hypothesis states that there will be no difference in the rate of healing of perineal trauma between the two groups.

Figure 3 shows the means of REEDA scores for the experimental and control groups at 1st examination and 2nd examination. Note that, at both times, the mean REEDA scores of the two groups differ. That of the control group is higher than that of the experimental group. However the difference between means is greater at the second reading.

Figure 3  
Relationship between Means of REEDA scores for  
experimental and control groups at 1st and 2nd  
examination



Because the difference between group means at 1st examination may have influenced the difference between group means at 2nd examination, this was statistically held constant when the means at 2nd examination were compared i.e. the differences between the means of the 1st REEDA scores were taken into account when comparing the 2nd REEDA scores.

To do this data were analysed using an Analysis of Covariance. This statistical test compares the difference between groups at the 2nd examination taking into account any differences at 1st examination. Analysis of Covariance partials out the variance between groups by performing regression analysis prior to Analysis of Variance. By doing this the effects of the differences between groups at 1st examination are removed (Burns & Grove, 1987, p. 543).

As predicted perineal trauma of patients treated with salt baths healed more rapidly than that of those who used showers only in the first 96 hours postpartum  $F(1,111) = 3.38, p < .05$ . The null hypothesis is rejected. The alternative hypothesis is accepted.

The difference between the means of the experimental and control groups at 2nd examination occurred in spite of the fact that the group who did not have salt baths had significantly longer showers ( $M = 78$  mins) than the

group who had salt baths ( $\bar{M} = 59$  mins),  $t(112) = 2.56$ ,  $p < .05$ .

#### Effect of Salt Baths on Rate of Infection

The second hypothesis states that there will be a lower rate of infection in the perineal wounds of patients treated with salt baths than in the wounds of those patients who shower only in the first 96 hours postpartum.

The null hypothesis states that there will be no difference in the rate of infection in the wounds of the two groups.

Components of the REEDA scale which measure redness and discharge were analysed using a one-tailed independent samples t-test. Using redness as an indicator of possible infection, the result obtained was as predicted. Perineal wounds of patients treated with salt baths ( $\bar{M} = .09$ ) were significantly less red than the wounds of those who showered only ( $\bar{M} = .49$ ) in the first 96 hours post partum,  $t(76) = 3.18$ ,  $p < .01$  indicating a lower rate of infection in this group. The null hypothesis is rejected. The alternative hypothesis is accepted.

Ninety-six hours post partum would be too soon to show significant purulent discharge as a sign of infection and this proved to be the case. There was no significant difference in the discharge from the perineal wound between those patients who were treated with salt

baths ( $\bar{M} = .11$ ) and those patients who showered only ( $\bar{M} = .25$ ) during the treatment period,  $t(102) = 1.08$ ,  $p > .05$ .

#### Effect of Salt Baths on Analgesia Requested

The third hypothesis states that patients treated with salt baths will request less analgesia for the relief of perineal pain in the first 96 hours postpartum than those who shower only.

The null hypothesis states that there will be no difference in the amount of analgesia requested for perineal pain between the two groups.

An independent samples t-test was used to analyse data to determine the effect of salt baths on the number of times analgesia was requested. The amount of analgesia requested for perineal pain by the group who had salt baths ( $\bar{M} = 2.3$ ) did not differ significantly from that requested by the control group ( $\bar{M} = 1.9$ ), in the first 96 hours post partum,  $t(112) = .076$ ,  $p > .05$ . Therefore the null hypothesis cannot be rejected.

Salt baths do not provide a greater degree of comfort than showers only during the first 96 hours postpartum if the amount of analgesia required is used as an indicator of discomfort.

#### Effect of Salt Baths on Pinkness

The fourth hypothesis states that the perineal area of patients treated with salt baths will be pinker than the perineal area of patients who shower only, in the first 96 hours postpartum.

The null hypothesis states that there will be no difference between the two groups.

Data were analysed using a one-tailed independent samples t-test to determine the effect of salt baths on pinkness of the perineum. There was no significant difference between the pinkness of the area surrounding the perineal wounds of the group who used salt baths ( $\bar{M} = .24$ ) and the perineal tissues surrounding the wounds of the group who were untreated ( $\bar{M} = .32$ ),  $t(112) = .93$ ,  $p > .05$ . The null hypothesis is accepted. The alternative hypothesis is rejected.

A 0.28% saline solution does not have an osmotic effect on the tissues and cause the pink appearance often noted. As already explained in the definition of terms, a hypertonic solution of saline requires a sodium chloride content of more than 0.9%.

#### Effect of Salt Baths on Moistness

The fifth hypothesis states that the perineal area of patients treated with salt baths will be moister than the perineal area of patients who shower only, in the first 96 hours postpartum.

The null hypothesis states that there will be no difference in the moistness of the perineal area between the two groups.

Data were analysed using a one-tailed independent samples t-test to determine the effect of salt baths on the moistness of the perineum. The moistness of the

perineal tissue of those patients who were treated with salt baths ( $\bar{M} = .27$ ) was not significantly different from that of those patients who were untreated ( $\bar{M} = .44$ ),  $t(112) = 1.75$ ,  $p > .05$ . The null hypothesis cannot be rejected.

As noted above, there is no evidence that the concentration of salt used in this study had an osmotic effect on the tissues and led to a moist perineum.

#### Sample characteristics

Demographic details of subjects were recorded on the Data Collection Sheet (Appendix I). Table 2 shows the means and standard deviations of this demographic data.

Table 2

#### Mean Numbers and Standard Deviations of Demographic Data

	Mean	SD
Age in years	29.92	5.46
Parity	1.86	.92
Blood loss in mls	348.99	238.69
Weight of babies in gms	3391.00	596.35

Subjects' ages ranged from 18 to 47 years.

Primipara and multipara patients were represented with a



range of parity from one to four. The estimated amount of blood lost at delivery ranged from 100mls to 1530mls. Patients who had lost more blood than this would probably have remained in delivery suite for more than 24 hours and would therefore not be included in the study.

Babies' weights ranged from 1340g to 5310g.

Every type of vaginal delivery was represented in the sample as Table 3 demonstrates.

Table 3

Correlations of Number of Patients with Type of Delivery

	Number of Patients
Spontaneous Vaginal Delivery	76
Neville Barnes forceps	10
Kiellands forceps	5
Wrigleys forceps	3
Lauffes forceps	1
Vacuum Extraction	17
Breech extraction	2
Twin Delivery	(3)
Total	114

Note: Because twin deliveries were also represented in other categories they are not part of the total.

Postpartum patients with episiotomy, first, and second degree tears and a combination of episiotomy and tear featured in the study. (See Table 4). There was one patient in the study with a third degree tear. This does not feature in the percentages in Table 4 as it was an extension of an episiotomy.

Table 4

Correlations of Percentage of Sample with Each Type of Perineal Wound

	Percentage of Sample
First degree tear	13.3
Second degree tear	23.0
Episiotomy	61.0
Combination of episiotomy and tear	2.7
Total	100.0

Analysis of Variance was used to analyse data. There was no significant difference shown at either first examination,  $F(3,109) = 1.93$ ,  $p > .05$ , or second examination  $F(3,109) = 2.15$ ,  $p > .05$ , between the different

types of perineal wound. Therefore, although Table 5 shows lower mean REEDA scores for 1st degree tears than for 2nd degree tears or episiotomies, this difference was not significant.

Table 5

Means and Standard Deviations of REEDA 1 and REEDA 2 Scores for Each Type of Perineal Wound

		REEDA 1		REEDA 2	
		Mean	SD	Mean	SD
1st degree tear	(n = 15)	1.87	1.36	0.80	1.08
2nd degree tear	(n = 26)	3.23	2.55	1.23	1.60
Episiotomy	(n = 69)	3.40	2.32	1.53	1.83
Episiotomy & tear	(n = 3)	2.67	2.08	3.33	1.53

Using analysis of variance to analyse data, Table 6 shows the correlations between weight of babies and parity, and degree of trauma as measured on the first REEDA score.

Table 6

Correlations between Demographic Variables and REEDA 1

	REEDA 1
Weight of baby	0.03
Parity	0.11

These very low correlations indicate that the degree of perineal trauma was not influenced by the size of the baby or the number of babies the patient had already had. In spite of the fact that the weights of babies delivered ranged from 1340g - 5310g, these very low correlations show no relationship between delivery of a very large baby and a high degree of perineal trauma. Conversely, nor do they show a relationship between the delivery of a very small baby and a low level of perineal trauma. These results do not support Carey (1971) who "found that mothers who delivered heavier babies had higher REEDA scores reflecting greater tissue trauma" (Davidson, 1974, p. 8).

There is also no significant correlation shown between the number of previous deliveries a patient has had and the initial trauma suffered as measured by the first REEDA score.

Table 7 shows the correlations between parity and blood loss and rate of healing as measured on the second REEDA score.

Table 7

Correlations Between Demographic Variables and Reeda 2

	REEDA 2
Blood loss	0.19
Parity	-0.20

Although the correlations in Table 7 are not high they are statistically significant at the .05 level. Because high blood loss leads to a possible anaemia which in turn may lead to a slower rate of healing and greater susceptibility to infection a higher REEDA score on second examination would be reasonable in these patients.

Reasons for a statistically significant correlation between parity and the second REEDA score are speculative. Perhaps caring for second or subsequent babies leaves more time for perineal care or again increased parity may mean increased efficiency in caring for the perineum.

Table 8 shows the relationship between the use of ultrasound and icepacks and the rate of healing of perineal trauma as measured on the second REEDA score.

Table 8

Correlations Between Ultrasound and Icepacks and REEDA 2

	REEDA 2
Ultrasound	0.00
Icepacks	0.16

These results show no significant correlation between the use of ultrasound and the rate of healing of the perineum when assessed on the second REEDA score. The relationship between the use of icepacks and the rate of healing of the perineum is also not significant.

## Chapter 5

### Discussion

#### Conclusions

##### Healing and infection

This study found that the rate of healing of the perineal wounds of patients treated with salt baths was significantly faster ( $p < .05$ ) when measured on the REEDA scale, than that of the control group in the first four days post partum. The rate of infection of the treatment group using redness as an indicator was significantly lower ( $p < .01$ ) than that of the control group. These results support the belief held by many patients and nurses (Sherman, 1979, Watson, 1984, and Austin, 1988) that salt baths have the power to clean and heal. These views were also supported by patients who took part in the study. Thirty-four of the fifty-five patients who had salt baths (62%) positively commented on their therapeutic value. They said that the perineal area was easier to clean in a bath than in the shower and that they would continue to use them at home. Five patients who had had salt baths previously, and not on this occasion because of random allocation, missed them and said that they too would be using them as soon as they got home.

Constant washing of the perineum may remove the normal microbial flora of the skin and other linings exposed to the external environment which have the ability to suppress the growth of those which are potentially more virulent (Vander et al., p. 603). Because the treatment group felt more satisfied with the cleansing of the perineum carried out by salt baths they spent significantly less time showering. In contrast the control group, by showering significantly more often may have removed the normal flora and exposed the perineal wound to more virulent bacteria.

Barclay and Martin (1983) found no significant difference in healing time or infection rate when they compared sitz baths with no treatment however their numbers were small, and their measurement of the perineal wound was carried out on untested scales. They recommended replication of the study on a larger scale. Barclay and Martin did not use salt in their baths but Sleep and Grant (1988) compared salt baths and no salt baths and found no appreciable difference in outcome between the groups. The concentration of the saline solution was not specified. Assessment of the perineum was by subjective measurement at ten days postpartum. The size of the sample in the present study produced a conclusive result and an objective measure was used to assess the rate of healing and degree of infection thus the limitations of previous studies have been addressed.



### Analgesia

There was no significant difference between the two groups in this study in the amount of analgesia taken for perineal pain however many of the subjective comments made by patients were related to comfort. Salt baths were described as soothing and comfortable. Patients described occasions when the perineum felt tight and painful before the salt bath and relaxed and pain free afterward. Many preferred sitting down and found the opportunity to do this in itself relaxing. All patients had showers so those in the treatment group could make a valid comparison between the two methods of cleansing the perineum.

Six of those who had salt baths felt that they were of no benefit. They found them time-consuming and unnecessary. Showers were easier to use, the bowl was too small and they were generally unimpressed by the salt bath procedure. Two of those who had had salt baths previously were happy not to be allocated to the treatment group. One said she found it easier to keep dry without salt baths and the other had had an infected episiotomy following her last delivery and did not like salt baths. She admitted that her judgment may have been clouded by her previous experience.

### Pinkness and moistness

There was no significant difference between the two groups in perineal pinkness or moistness. This result

negates the belief that the amount of salt recommended in the hospital protocol was excessive. Some subjects commented on the marking of the measuring cup and said that it was helpful to know exactly how much salt they should be putting into the water. From this study it would seem that salt is no more drying than ordinary washing and that the ability to dry the area is not related to how it is cleansed.

### Ultrasound

The lack of correlation between the use of ultrasound and the condition of the perineal wound when assessed by the REEDA scale 96 hours postpartum supports the findings of previous researchers (Grant and others, 1989). Their study found no clear differences in pre and post treatment assessment of pain, oedema, bruising, haemorrhoids, and amount of analgesia taken when comparing ultrasound, pulsed electromagnetic energy and a placebo.

### Generalization

Because of the size of the sample, the status of the hospital within the state and the fact that patients were randomly allocated to treatment and control groups the results of this study may be generalized to all postnatal patients who suffer an episiotomy, first, second or third degree tear or combination of episiotomy and tear.

### General Comments

When the hospital was busy patients who had delivered were required to wait in delivery suite for extended periods before transfer to the ward. On these occasions the researcher interviewed and examined the patient in delivery suite and requested that she ask for her group allocation when she arrived on the post natal ward. This worked successfully on most occasions and only failed when the person caring for the patient on the ward was new or unfamiliar with the hospital and knew nothing of the study.

The level of staff support was high but one midwife interfered and told her patients that they did not have to time their showers if they were having salt baths. She also told those having salt baths to use cold water. Fortunately the patients on these occasions felt sure that she was wrong and kept a record of the length of their showers. One of the patients who had cold salt baths was happy with them but the others felt that the baths would have been much more soothing if they had been warm. This only happened once and was quickly corrected.

Data collection was extremely time consuming since there is so much going on in the life of the post natal woman. The baby might be crying or need a feed or a bath, visitors might be present, staff might be attempting to do observations, or the doctor might be

visiting. Much patience and perseverance were required on the part of patients and researcher.

Because of the limitations on sample selection it became obvious early in the study that many of the subjects were patients of one consultant obstetrician. When she was contacted and the research explained she was very supportive. One other consultant obstetrician recommended salt baths to his patients and was not happy with their participation in the research. He too was contacted and after a discussion was satisfied with the standard and value of the study and gave permission for his patients to take part.

When the study began it was hoped to achieve a sample of 150. Unfortunately these numbers were not possible in the time available because of the limitations imposed by the Raine Study, and because it is now hospital policy to deliver without cutting an episiotomy if possible.

Recruiting subjects for the study was probably made easier because salt baths were no longer being recommended by the hospital. If salt baths had been freely available most patients who had used them previously would not have been prepared to do without them on this occasion.

The level of patient compliance was high and many were supportive of the research because they hoped that salt baths would prove to be therapeutic and continue to

be available at the hospital. To achieve this they were prepared to accept random allocation to groups in spite of a strong desire to be part of one specific group. Staff were very supportive of the study and encouraged patients to take part. They too wanted research support for their views.

The researcher was employed as a midwife on permanent night duty on one of the wards from which the sample was drawn. For the duration of the study treatment of perineal trauma was not discussed with patients by the researcher and nursing staff did not mention when patients were having salt baths. This ensured the researcher remained blind to group allocation.

### Recommendations

It is recommended that post natal patients be informed of the therapeutic effects of salt baths in the treatment of the perineal wound and that they be given the option to use them if they wish. It should be explained to them that many patients find salt baths beneficial while others find them to be a waste of time and that they are free to choose their own method of perineal care. Ultrasound and icepacks are recommended in obstetric units even though their therapeutic value has not been substantiated by research. It seems reasonable, based on the findings of this research, that salt baths also be recommended.

This study was carried out by a single researcher. It is also the first study to compare treatment with salt baths and no treatment using a sufficiently large sample to achieve a conclusive result. Replication is therefore recommended to confirm the outcome.

The quantities of salt and water used in this study result in a 0.28% solution. Subjects in the Sleep and Grant study may have used a 0.07% or a 0.03% solution. As there is still doubt about the value of salt in any concentration replication of the study is suggested comparing treatment groups which use varying concentrations of salt in water and a control group which is untreated.

The REEDA scale is an accurate, objective measure of the empirical signs of inflammation and infection. It is therefore inversely measures the rate of healing. It is not a measure of pain. It is suggested that using the REEDA scale to measure trauma as a means of assessing levels of discomfort should be avoided. Interrater reliability correlations using the REEDA scale are inconsistent possibly due to the period post delivery during which the assessment of the perineum takes place. In the first 24 hours postpartum the signs of trauma may be more obvious and measurement may therefore be more consistent. Hill (1989) found that "none of the subjects had any discharge on their initial assessments" (p. 129). She suggested that this category might be eliminated. If

the REEDA scale is being used during the first 48 hours post delivery this may be appropriate but for longer term assessments the category should be retained. The tool has not been modified since publication and further refinement may be advisable.

Nurse educators responsible for student midwives did not fulfil their role and the researcher found that she was constantly having to explain the study and the degree of staff involvement necessary, to student midwives as they were allocated to the ward. It is therefore recommended that where applicable students who are involved in research be informed of their responsibilities when they are in the classroom situation.

To ensure that the researcher was blind to group allocation it was necessary to give all the information required at one time. The information sheet should have solved this problem for patients and staff however very few read it even when its availability was stressed during the first interview. This may be a measure of the fact that society no longer looks to the printed word for information. As television is the preferred medium perhaps use should have been made of the in-house channel on the television which was available to all patients.

### Summary

The purpose of this study was to discover whether salt baths promote healing, prevent infection and provide

comfort when used to treat perineal trauma. The results were a surprise to this researcher, and to many others. They justified the faith of the believers, friends and colleagues whose eyes light up when they describe the bliss of salt baths twenty-two years later, and today's patients, who were prepared to be randomly allocated to groups to scientifically prove their effectiveness. Fitting salt baths into an already busy day may not add to the anxiety of many new mothers but may provide the comfort and relaxation which helps them to adjust more rapidly to their new role. Findings of this study suggest that midwives may continue to advocate the use of salt baths knowing that their effectiveness has been supported by this research.



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## APPENDIX A

### Information Sheet Delivery Suite

#### An Assessment of the Merits of Salt Baths and Showers in the Care of the Perineum Postpartum

I have begun researching the above topic and will be contacting the midwife receptionist of delivery suite three times a day to get the names of patients who have an episiotomy, tear or combination of episiotomy and tear, who are not part of the Raine Study and who go to Wards 3 or 4.

Once I have this information I shall see the patient on the ward between four and eight hours post delivery to invite them to take part in the research. 150 patients will be included in the study and the length of time it takes will depend on how soon this number of patients is seen.

I realise that providing this information may be an extra frustration when you are busy but will be very grateful if you can help in this way.

If you have any queries about the study please contact me on Ward 4 at night or 341 6552 (Home).

Patricia Dey  
Researcher

APPENDIX B

Consent Form

An Assessment of the Merits of Salt Baths and Showers in  
the Care of the Perineum Postpartum

I, ..... hereby agree to participate as a volunteer in the above study. It has been explained to me that salt baths are not the only treatment available for care of the perineum and that normal hygiene may be equally effective. I realize that I shall be participating in the study for the next 96 hours (four days) and that I shall be using either salt baths or normal hygiene. I understand that taking part in the study will not endanger my health and that it will provide valuable information about care of the perineum postpartum which will improve nursing care and patient well-being. I realize that I do not need to participate and that I may withdraw at any time without penalty. I have been assured that my name will not be used on any of the information obtained or any of the results published. I understand that the research is designed to find out the best way to care for a perineal wound. I have been given the opportunity to ask questions and have had them answered to my satisfaction. I know that Ms Dey is available at 341 6552 if I have any further concerns and that I may contact the Head of Department at the Western Australian College of Advanced Education School of Nursing on 383 8333 if I am unhappy about any of the research procedures.

I have received a copy of this consent form.

Participant ..... Researcher .....

Witness ..... Date .....

## APPENDIX C

### Information Sheet

#### An Assessment of the Merits of Salt Baths and Showers in the Care of the Perineum Postpartum

Following delivery of a baby many women have an episiotomy or tear which is sutured. Many different treatments are suggested to provide comfort and promote healing of this wound. For some years this hospital has recommended salt baths but the use of these has not been scientifically evaluated and many people believe that normal hygiene may be less time consuming and equally effective.

If you agree to take part in this study you will be allocated to one of two groups. Both groups will be asked to maintain normal hygiene and record the time and length of each shower which is taken on a special sheet of paper. The patients in one of the groups will also have four salt baths a day lasting for five minutes each. They will add 10mls of salt to a full bowl of water at whatever temperature is comfortable for them. Timers will be provided. The persons caring for you will explain the procedures followed, including how to dry properly after the baths, and will examine your stitches daily as usual. If you take any pain killers or use ice packs or ultrasound these will be recorded on a special sheet also.

As has been explained, your participation in this study will provide us with valuable information about the best way to help you to care for your stitches, however you may withdraw from the study at any time without your care being affected in any way. All the information collected will be kept in the strictest confidence and your name will not be used on any of the record sheets.

If you have any further questions or would like to know the results in June 1991 when the study is completed please contact me on 341 6552.

Patricia Dey (Researcher)



## APPENDIX D

Salt Bath Record SheetAn Assessment of the Merits of salt Baths and Showers in  
the Care of the Perineum Postpartum

Date	Time commenced	Length in minutes

Please enter the date, time commenced and length of your salt baths in the columns provided. Please sit in a salt bath for five minutes four times a day. It is important for the researcher to know if you do not manage to do this. If you are unsure of what to do ask the person caring for you to explain. Thank you for your cooperation.

APPENDIX E

Shower Record Sheet

An Assessment of the Merits of Salt Baths and Showers in  
the Care of the Perineum Postpartum

Date	Time commenced	Length in minutes

Please write down the date, time commenced and length of your showers in the columns provided. Set the timer when you begin your shower and record how many minutes have passed before you dry yourself. If you are unsure of what to do ask the person caring for you to explain. Thank you for your cooperation.

**APPENDIX F****Analgesia Record Sheet****An Assessment of the Merits of Salt Baths or Showers in  
the Care of the Perineum Postpartum**

Date	Time	Analgesia Type & Amount	Reason Given
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Please include ice packs and ultrasound on this sheet.

## APPENDIX G

Group Allocation ListAn Assessment of the Merits of Salt Baths or Showers in  
the Care of the Perineum Postpartum

No Salt baths Showers only      No Salt baths Showers only

017	X		031		X
018		X	032	X	
019	X		033	X	
020		X	034		X
021		X	035		X
022	X		036	X	
023		X	037	X	
024	X		038		X
025		X	039	X	
026	X		040		X
027	X		041	X	
028		X	042		X
029	X		043		X
030		X	044	X	

## APPENDIX H

### Information Sheet

#### Nursing Staff Wards 3 & 4

#### An Assessment of the Merits of Salt Baths and Showers in the Care of the Perineum Postpartum

Dear

On Monday 16th July, with your help and that of Shani Faulkner, I shall begin researching the above topic.

Patients who have an episiotomy, sutured tear or combination of episiotomy and tear will be contacted on the ward between four and eight hours after delivery. Shani or I will explain the research and invite them to participate. After the use of the timer is explained, they will be asked to time their showers and record the date, time commenced and duration on a record sheet. The episiotomy or tear will then be assessed using the REEDA scale which measures redness, (o)edema, ecchymosis, discharge and approximation of skin edges. Following this the person caring for the patient will be asked to witness the signing of the consent form. Because it is important that neither Shani nor I know which patients are using salt baths we will then hand the patient over to you.

Using random numbers patients will be allocated to one of two groups. The control group will use normal hygiene and treatment group will have salt baths as well as normal hygiene. Using the information on the list provided on each ward, you will allocate the patient to either the salt bath or normal hygiene group. If appropriate, a bowl, salt and measuring cup will be given to the patient and the procedure to be followed explained. For the purpose of the research it is important that patients follow the instructions exactly. They will be asked to add 10mls of salt to a full bowl of water at whatever temperature they find comfortable four times a day and to sit in it for five minutes. Please explain the importance of careful drying and check that this is being done correctly. Each salt bath is to be recorded on the salt bath record sheet.

I should also like you to record the analgesia you give for perineal pain, including ice packs and ultrasound, on the record sheet provided.

Between 94 and 96 hours post delivery we shall assess the perineum again and collect the timers and record sheets.

This all sounds rather complicated and time consuming but the detail is important if we are to get valid results and I'm sure it will become clearer once we start. A copy of the proposal is available on the ward to explain the project in more detail.

If you have any problems I may be contacted at home on 341 6552 or on Ward 4 where I work full-time permanent night duty.

Thank you for your cooperation.

Yours sincerely

Patricia Dey

Researcher

# APPENDIX I

## Data Collection Sheet

### An Assessment of the Merits of Salt Baths or Showers in the Care of the Perineum Postpartum

Research Identification No .....  
 Age of Subject .....  
 Parity .....  
 Type of Delivery .....  
 Weight of Baby .....  
 Blood Loss .....  
 Type of Perineal Trauma: 1st degree tear  
                                   2nd degree tear  
                                   3rd degree tear  
                                   Episiotomy  
                                   A combination of episiotomy  
                                   and tear.  
 Doctor:  
 Occupation: